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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,266	06/23/2003	Masao Moriguchi	SLA0770	1706

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EXAMINER
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PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1762

MAIL DATE	DELIVERY MODE
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06/29/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/602,266

Applicant(s)

MORIGUCHI ET AL.

Examiner

Marianne L. Padgett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21,23 and 25-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21,23 and 25-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/18/2007 has been entered.

Applicant citation of page 10, lines 19-20 to provide the defining statement of "By located between, we me that the sides can be co-located on one or both sides of the GBs", is considered to be sufficient for providing clarification concerning the limitation of "between" with respect to grain boundaries in claims such as 13-17.

With respect to the amendment to the specification adding that description "sub-steps" with respect to figure 4, this is considered to be consistent with figure 4 & the original specification, but provides no significant clarification as to what those alphabetically labeled figures of sub steps represent.

2. Claims 1-21, 23 & 25-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-21, 23 & 25-44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

While the amendment to in the independent claim 1, inserts a phrase that is logical when considered by itself, it contradicts previously limitations, specifically the claim now reads "a series of 2-shots laser irradiation steps, where each series includes N number of steps of lateral growth in a first direction and N number of steps of lateral growth in an orthogonal directions" (lines 6-8 emphasis added), where the initially required "a series" is singular, i.e. there is only one series, made up of 2-shot steps, but

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the amended limitations are to an unspecified number of series labeled "each series", where each step is defined by lateral growth in one of two directions and has nothing to do with 2-shots. Also note the disagreement between singular & plural in "an orthogonal directions". On page 18 of applicants' 4/18/2007 response, they cite a teaching from the specification, that is found on page 6, lines 13-15 that states "In the 2N-shot method, an amorphous silicon (a-Si) film is exposed to a series of 2-shot laser irradiation steps with 'N' equal to the number of steps. For each step, the substrate (or beamlets) is rotated 90° with respect to the direction of lateral growth of the previous step." The present claim language is inconsistent & confusing, and not in agreement with this teaching from the specification, as the citation from specification effectively says that each step has 2 shots, then one changes direction by 90°, and one does this N number of times. The new phrasing added to claim 1 on the other hand indicates that there are 2N steps (instead of shots), where if read as grouped, one makes N-shots of lateral growth in the first direction and then rotates to the orthogonal direction for another N-shots, which is inconsistent with both the specification & the preceding phrasing in the claim, thus would appear to encompass New Matter, as well as making examining with respect to prior art the claims as written very problematical.

Considering these limitations, applicant's discussion & the actual language of the specification, would applicants' intend be --... exposed to a series of 2-shot laser irradiation steps causing lateral growth, where N is the number of steps in the series, and where after each step the direction is changed orthogonally, so as to alternate the lateral growth between a first direction and an orthogonal direction --? It is consistent with cited sentences on page 6, however the examiner still cannot figure out how in figure 4, views (b)-(i) represent sub-steps from the 2N-shot method, where  $N = 2$ , as there are too many frames to represent 4 laser shots, so what do the extra frames represent, or is there a discrepancy or phrasing problem inside the definitions, such the specification itself is self-contradictory or inconsistent? For instance, considering the phrasing added to the claims in this last amendment, which might if inconsistencies are ignored be construed for the overall claim 1 to mean 2-shot N times in the first lateral

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growth direction, followed by 2-shot N times in the orthogonal growth direction, which would match up with the frames of figure 4, i.e. 4(b)-(e) for the first direction & 4(f)-(i) for the orthogonal direction as there was no original description defining this frames adding description to match as claim 1 is presently amended with the new matter), but this is not at all consistent with the recitation on page 6, lines 13-15, such that the examiner is unclear as to exactly what is being taught & claimed. **Is there some confusion between steps & shots, if so exactly what?** The examiner notes that the cited & quoted section from page 8 concerning figure 6, would appear to be important in defining the effects of the process & the significance of those effects, but we still need to clarify exactly what the process is.

With respect claim 2, the examiner notes that the amendments therein reasonably match the amended changes made in claim 1 (thus also encompass New Matter), except it is uncertain whether the "a first direction" in line 6 is the same or a new first direction as recited in the independent claim, as it is associated with the aperture pattern not the growth direction & does not use an article showing antecedent basis, but is the same phrase. However, the actions of claimed to do not match the teaching as recited from page 6, since the direction is changed after N number of steps, not after each step.

It is noted that as described in the specification,  $N = 1$ , means there is only one step of two laser shots, thus no  $90^\circ$  rotation takes place, so there is no orthogonal lateral growth, but in the amended part of claim 1, it would appear that  $N = 1$  requires one laser shot in a first direction followed by a second laser shot in an orthogonal direction, or maybe it requires 2 laser shots in the first direction, followed by 2 laser shots in the orthogonal direction, again providing uncertain/confusing meaning, which appears to be inconsistent with the specification, thus encompass New Matter.

In claim 11, line 4 introduces "a third aperture pattern", which makes it potentially different from the limitations ("an aperture pattern oriented in a first direction" & "an aperture pattern oriented in a second direction, orthogonal...") of claim 2, from which claim 11 ultimately depends, however the subsequent limitation of "orienting an aperture pattern in the first direction" on line 5 of claim 11 is vague

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and indefinite as it is uncertain whether it is referring to the immediately preceding aperture pattern an entirely new aperture pattern or either of the previously introduced aperture patterns, as it has no antecedent basis to any of them, nor clear differentiation therefrom, unless one considers direction to define pattern, but direction is not a shape or pattern. Consequently note that in line 6-7, the aperture pattern" may refer to any of the previously introduced aperture patterns & in line 8 of claim 11 "the aperture pattern in the first direction", can prefer to either or both the identically phrased limitation in either claim 11 or 2. Also see claims 19-21 which now depend from 11.

Question, is it actually applicant's intent to claim differed apertures for the two direction for the 2N-shot process, or merely change the direction of that aperture, while using the same aperture? Also is there intended to be any necessary relationship between the apertures used for the 2N-shot process & the SD process? The present term phrasing & article usage do not make these issues clear. The amendments to claims 19-21 & 23, give the examiner the impression that the apertures are intended to be the same shape for all of the steps, both 2N-shot & SD processes, where it's just the direction in which the aperture is applied that is changed, however the above noted inconsistencies do not quite support this impression.

Applicants' explanation of claim 25, and thus similar language in claims 28 & 35, on page 17 of their 4/18/2007 response is noted to provide clarification of intent, however the examiner notes that the language in the last two lines of claim 25 "annealing that the first area in response to the first and second energy densities" can still be considered unclear, as phrased, as the "in response to" can reasonably mean another action done in response to this applied energies, or as suggested by applicant's discussion describing the effects of the first & second energy densities. Would applicant's intent be appropriately clarified by language, such as --wherein the first and second energy densities employed on the first area cause annealing of the first area--?

The amendment claim 39 is a further step backwards, since now instead of some inconsistent language, which attempts to place the amorphous silicon layer, now the film of amorphous silicon has

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never necessarily been formed at all on the transparent substrate introduced in this claim. Would the intent of claim 39 be accurately conveyed by inserting -- a portion of the film of the amorphous silicon, defined by -- between "underlying" & "the first area"?

3. The disclosure is objected to because of the following informalities: the description of figure 4 remains objected to, in that the meaning of all 9 alphabetically labeled figures of figure 4, remains undefined or unclear.

Appropriate correction is required.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sposili et al. (6,577,380 B1), discussed in sections 24 & 7 of the action mailed 9/19/2006 & 3/1/2007.

For considering the claims with respect to prior art one only needs to consider the simplest case of  $N=1$ , which depending on whether one reads 2N-shot process considering the discussion specification, such that one applies to shots in the same direction that caused lateral growth, or if one considers the requirements added to claim 1 (which contradict the limitation they're supposed to be describing), which

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would require one shot causing lateral growth in one direction, with a second shot causing lateral growth in an orthogonal direction. Note that as the "first area" is an arbitrary size & location, it does not matter how much or how little area it covers, nor does it matter if there are many irradiation locations that can be called first areas or only one. Also claim 1 requires an annealing step, with unspecified results that takes place in a "second area" which is either all or part of the first area, and since it is lacking in any temporal or necessary antecedent limitations can take place either before or after the 2N-shot process, but is also not necessarily differentiated there from for  $N=1$  as discussed by the specification on page 6. The examiner notes that for lateral growth from either two shots in the same direction or two shots in orthogonal directions, the plurality of parallel grain boundaries of claim 3 would appear to be met. Therefore, the previous discussion of Sposili et al. (380), which is inclusive of rotating or translating mask positions for sequential laser irradiation processes, can still be considered consistent with the simplest possible claim procedures ( $N = 1$ ), hence for reasons as previously discussed is consistent with possibilities included by applicants' still broad & ambiguous claims. With respect to the amendment to the independent claim (the added part of the 2N-shot process), which requires some kind of use of orthogonal directions, that while generic rotation is not necessarily on the orthogonal, it is a typical in conventional procedure to rotate a mask  $90^\circ$  so as to optimize area coverage, since none perpendicular directions would provide less consistent area coverage. If more than  $N = 1$  was required, this rejection might be removed, but it would depend on what the claims actually really ment, which cannot be definitively determined at this point.

6. Claims 11-21, 23, 25-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sposili et al. (380) as applied to claims 1-10 above, and further in view of Yamazaki et al. (5894137), plus Fukunaga et al. (2004/0142543 A1) or Kawasaki et al. (6653657 B2) as discussed in sections 21-22 & 25 of the action mailed 9/19/2006, and lacking clearer meaning in the broader claims are considered still applicable.



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7. Applicant's arguments filed 4/18/2007 & discussed above have been fully considered but they are not persuasive.

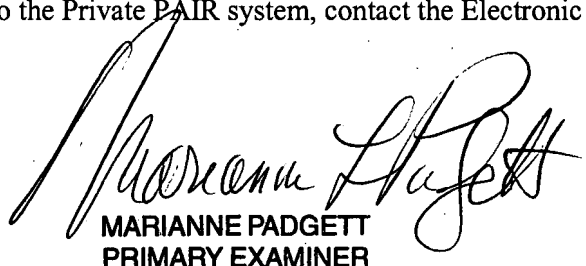
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on M-F from about 8:30 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MLP/dictation software

6/24/2007



MARIANNE PADGETT  
PRIMARY EXAMINER